UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

DRAFT DATE: April 8, 2004
FINAL DATE: April 19, 2004

SUBJECT: Full Compliance Evaluation Inspections of Five Facilities Operated by Duro Textiles, LLC in Fall River, MA

FROM: Roy Crystal, Air Technical Unit R. C.

THRU: Denny Dart, Senior Enforcement Coordinator, Air Technical Unit DP

TO: File

I. Facility Information

A. Facility Name: Duro Textiles, LLC
B. Facility Location: Fall River, MA
C. Facility Mailing Address: 110 Chace Street, Fall River, MA 02724
D. Facility Contact and Phone Number: David Ethier, Environmental Manager (508) 675-0101
E. Physical Address of Facilities:
Duro Industries-Finishing Plant, 110 Chace Street, Fall River, MA
Duro Textile Printers-Print Plant, 206 Globe Mills Avenue, Fall River, MA
Duro Plant 2, 1 Middle Street, Fall River, MA
Stedro Textiles, 100 Globe Mills Avenue, Fall River, MA
Bayside Laminating, 848 Airport Road, Fall River, MA
F. Title V designations: major (Duro Industries Finishing Plant, Duro Textile Printers, Duro Plant 2, and Stedro Textiles - combined as one Title V application); synthetic minor (Bayside Laminating)

II Background Information

A. Date of inspections: February 24-27, 2004
B. Weather Conditions: 25 degrees F, clear, little wind
C. U.S. EPA Representative(s): Roy Crystal, EPA air inspector
Joe Canzano, EPA water inspector
D. State Representative(s): None
E. Facility Representative(s) at inspection: David Ethier, Environmental Manager
Mansour Nejad, Vice President, Quality And Engineering

Steve Laderia, Boiler Operator

III Opening Conference:

The EPA air and water inspectors arrived at 9:20 a.m. on Tuesday, February 24, 2004 and met with David Ethier and Mansour Nejad in a conference room at Duro Finishing ("DF"). They showed their credentials and requested permission to conduct an inspection of the facility. The EPA air inspector explained that he planned to conduct a full air compliance evaluation and that water issues would be raised by the EPA water inspector as appropriate. He also indicated that photographs would be taken as needed throughout the inspection. The facility representatives granted permission to conduct the inspection and take photographs.

The present parent corporation of the facilities inspected is Duro Textiles, LLC. This corporation was founded in November 2002; it includes several other previously-distinct facilities under one common ownership. Duro Finishing was founded in 1947 with eight employees. It expanded gradually, buying used equipment. It conducted a variety of fabric dyeing and finishing operations. Its primary products included camouflage fabrics, heavy nylon for luggage, and linings for clothing. Duro Textile Printers, operated as a separate company with the same owners, conducted printing of fabrics (including printing the camouflage fabric produced at Duro Finishing). Pioneer Finishing conducted processing (dyeing and finishing) of ladies' garments, mostly made of polyester. Pioneer was eventually purchased by Duro and re-named Duro Plant 2. Stedro Textiles was also purchased; its operations were essentially integrated into those at Duro Textile Printers ("DTP"). Bayside Laminating was formerly located within the same building as DF. In 1995 it moved to its current location at 848 Airport Road in northern Fall River.

In 1997 the original owners sold most of the their equity in the companies to a group of investors from California, retaining a 20% stake. The overall operation was re-named Duro Industries, Inc. at that time. Due to a slump in the textile industry and a recession, the company then ran into financial difficulties. It filed for Chapter 11 bankruptcy protection in October 2002. The Chapter 11 filing was turned down by the court and instead the company was sold at auction. Its purchasers reconstituted the operation as Duro Textiles, LLC in November 2002. In addition to the five inspected facilities, there is also a separate facility in Wilmington, MA (Duro Fiber Co., Inc.) and a sales office in New York City.

The operations of the five facilities inspected are inter-connected. Duro Finishing, Plant 2, Duro Textile Printers, and Stedro are located within several blocks of each other in central Fall River (the latter two are contiguous). These four nearby facilities are organized as divisions of Duro Textiles, LLC; their operations appear to be integrated. Bayside Laminating ("Bayside") has some integrated operations and some that seem to be separate, as explained below.

At present there are approximately 500-600 full-time employees at the four nearby plants.

David Ethier said that for the sake of convenience, the company has kept on reporting for each facility separately under most regulatory reporting requirements, including air Source Registration, because that is how the data are kept. Tracking of VOC and other pollutants with emission limitations are also done for a particular process and facility. David Ethier said that it was appropriate and most efficient to consider each of the five facilities as a separate facility for inspection purposes. Accordingly, the EPA inspectors agreed with the facility representatives to discuss and inspect each facility separately, starting with DF.

Each of the facilities has over the years been issued a number of air permits for individual processes. Each of the four nearby facilities had applied separately for a Title V operating permit. In February 2003 Duro Textiles LLC submitted a single revised Title V permit application that integrated the previous applications of DF, Plant 2, DTP, and Stedro and proposed to permit them as one facility (Bayside's operations were not included).

IV Applicable Requirements Reviewed During Inspection

Massachusetts Visible Emission (opacity) regulations - 310 CMR 7.06 (boilers, process lines) and 7.04(2), requirement for smoke density meter

Massachusetts Plan Approval and Emission Limitations - 310 CMR 7.02 - permit approvals

Massachusetts VOC RACT Regulations for coating operations - 310 CMR 7.18 (1 &2), U Volatile and Halogenated Organic Compounds (affects process lines)

Massachusetts NOx RACT requirements for boilers - 310 CMR 7.19(6)

New Source Performance Standards 40 CFR 60, (boiler)

40 CFR 63, Subpart OOOO - Printing, Coating and Dyeing of Fabrics and Other Textiles

V Description of Regulated Emission Units and Processes:

Duro Textiles, LLC, (Duro) prepares, dyes, prints, coats and finishes various blends of fabric. The 2003 revised Title V permit application classifies the four included facilities (DF, Plant 2, DTP, and Stedro) as consisting of 52 emission units (a list is included in the Appendix). No comparable breakdown is available for Bayside, but the inspection yielded the needed information. Table 1 is an overview of current operations at the five facilities.

VOCs are the most significant emission source at the Duro Textiles facilities. At present, individual processes have VOC limits spelled out in various permits. Total annual VOC emission

limits for the several processes at the four nearby facilities (DF, Plant 2, DTP, and Stedro), are summarized in a table in the Appendix taken from Duro's February 2003 revised Title V application. This table is based on currently-in effect permits and the emission unit designations in the 2003 revised Title V permit application.

As this table displays, when the individual process limits are totaled, the total permissible VOC emissions for these four operations combined are181.4 tons per year. The draft Title V permit application proposed this combined total as a faciltywide limit of 181.4 tons of VOC per year; the current annual VOC emission limits for each process would still be maintained.

The four nearby Duro facilities operate 16 boilers on No. 6 fuel oil and/or natural gas. Some of these are over 10 MMBtu. (See the Appendix table, attached, for the requirements for boilers at DF, Plant 2, DTP, and Stedro.)

The five facilities were discussed in initial meetings over the four days of the inspection, followed by a walkthrough of each facility. There have been some changes at each of the facilities since the most recent Title V permit application was submitted. The discussion below and Table 1 summarize information gained from the initial meeting and walkthroughs of the five facilities.

Table 1 - Overview of Emissions

Facility/Major Processes	Major Air Emission Sources/ Emission Units	Air Pollutants & Air Pollution Control Devices
Duro Finishing		
Steam/heat production	4 Boilers (EU6 –DF to9-DF)	Particulates, opacity, NOx
Fabric preparation		Minor VOCs (fugitive)
Dyeing	Dye House - 40 DF	VOCs (fugitive)
Finishing	7 Tenter Ovens - 32-DF to 38-DF (VOCs)	Particulates, opacity, VOCs - "smoke abators" (incinerators)
Aqueous Coating	3 aqueous coating lines	VOCs
Solvent Coating	2 Solvent Coating lines (3 and 4) & Afterburner - 39-DF	VOCs - Thermal Oxidizer for Solvent Coating Line
Plant 2		
Steam/heat production	4 Boilers (1-P2 to 4-P2)	Particulates, opacity, NOx
Dyeing	Dye House - 30-P2	VOCs (fugitive)

Facility/Major Processes	Major Air Emission Sources/ Emission Units	Air Pollutants & Air Pollution Control Devices
Plant 2 - contd.	**Table 1 - Overview of Emissions - contd.**	
Finishing	3 Tenter "frames" (ovens) - #1 (17-P2), #3 (28-P2), and #8 (29-P2); new "Duroshield" process on modified Line & Pin Tenter Frame #4 (27-P2) - fabric for chemical warfare protection suits; one Loop Dryer, 19-P2 (intermediate production step); 2 other tenter frames recently dismantled - #5 (23-P2) & #6 (25-P2)	Particulates, opacity, VOCs - "smoke abators" (incinerators) on tenter frame #1, Duroshield process, & Loop Dyer; wet electrostatic precipitator on tenter frames #3 and #8
Laminating	Laminator 2 with Maxon burner - 26-P2	No control equipment
Duro Textile Printers		
Steam/heat production	3 boilers - #1 (10-DTP), #2 - (11-DTP), #3 - (12-DTP) - #6 fuel oil & natural gas capable but only burn natural gas	
Printing	4 printers - Stork 101 (45-DTP), Stork 102 (46-DTP), Stork 103 (47-DTP), Stork 104 (48-DTP)	Particulates, opacity, VOCs - Wet ESP #1 treats 3 printers (Stork #'1 101, 102, 104)
Preparation	Fabric initially prepped with sodium hydroxide, then washed in wash range	Sodium hydroxide, acetic acid

Facility/Major Processes	Major Air Emission Sources/ Emission Units	Air Pollutants & Air Pollution Control Devices
Duro Textile Printers - contd.	**Table 1 - Overview of Emissions - contd.**	
Finishing	3 tenter frames - 50-DTP, 51-DTP, 53-DTP (internal numbering changed often)	Particulates, opacity, VOCs - Wet ESP #2 treats 3 tenter frames and printer Stork #104
Steam aging	Colors "set" (developed) by exposure to steam	
Stedro/Duro Textile Printers		
Steam/heat production	5 boilers - Boiler 5 (5-Stedro-DTP), Boilers 1-4 (13-Stedro/DTP to 16-Stedro/DTP)	Particulates, opacity

VI Facility Descriptions, Discussion, and Walkthroughs

Duro Finishing (DF) Process Description: At DF, there are six primary operations: steam/heat production, fabric preparation, dyeing, fabric finishing, aqueous coating, and solvent coating. The primary products produced are camouflage fabrics for military and civilian use; apparel linings (formerly significant, but now only small production), and performance fabrics - Goretex, Cordura, etc. Raw fabric entering this facility on wide rolls, called "greige goods", is first treated in the Preparation and Bleach area - bleached, washed or treated with chemicals. This operation has minor VOC emissions. The fabrics are next dyed in the Dye House (Emission unit 40-DF, Dyehouse Operations). There are four types of dyeing - burl dyeing, jet dyeing, beam dyeing, and jig dyeing - each of which employs different equipment. In the Dye House, the heated baths are an important VOC source (14-15 tons per year actual VOC emissions). (There is an emission cap of 23 tons of VOC per year for finishing and dye house operations combined in Plan Approval 4P95001). (See Appendix table).

The four boilers at this facility provide steam heat and hot water to the dye house. The facility has

several boilers because the production loads vary. The boilers burn #6 fuel oil as their primary fuel and have natural gas capacity as a backup. By permit requirement (Plan Approval #4BP2043), sulfur content in the #6 fuel oil is limited to 0.55 lb/million BTU. NOx, particulate matter (PM), CO, and SO2 emission levels for the boilers are set by the same permit; they vary for the different boilers.

Finishing is an aqueous process. The fabric is suspended on large rolls and first dipped into a trough in which finishing chemicals are dissolved, permeating the fabric. The continuously-moving fabric then passes through an oven in which it is dried. Finishing is done in order to add a desired property (e.g., flame retardance) to the fabric. The finishing devices combining the dip bath and the drying oven are known as"tenter frames" or "tenter ovens" (the same thing).

Coating operations are those in which a knife edge is used to impart a thin layer of material to the fabric of controlled thickness. There are two types of coating operations: aqueous and solvent-based. After being coated, the fabric passes through a drying oven. Aqueous coating involves a mix of about half and half water and solids, with small amounts of VOCs such as formaldehyde, isopropyl alcohol and glycols added to the mix. The solids are typically polymers that become impregnated to the fabric. There are three aqueous coating lines - Aqueous Coating #17 (Emission Unit 41-DF) and Aqueous Coating CR-1 and CR-2 (Emission Unit 42-DF). Aqueous coating is a source of low to moderate VOC emissions. By contrast, solvent coating involves use of a large amount of solvent in place of the water; it is a major VOC source (35-45 tons per year of actual emissions). The solvent VOC emissions are controlled by a thermal oxidizer.

Permit Requirements at DF: On March 30, 1988, MA DEP, in Plan Approval Application No. 4P87154, issued its approval for the installation of the two solvent coating lines and the single Wolverine Model Jetzone thermal incinerator that controls them. This approval specifies that "operation of solvent coating lines 3 and 4 shall be interlocked such that the coating process cannot commence until a temperature of 1,400 degrees Farenheit (F.) is achieved in the incineration chamber. During process fluctuations (idle mode, changeover, etc.) incinerator temperatures will continuously be maintained at 1400 degrees F. by means of the modulating combustifume burner system and automatic positioning of the oven exhaust flow damper to minimize flow turndown (6 to 1)."

MA DEP issued Conditional Approval Application No 4P95001 on June 7, 1995 that permitted construction of three new aqueous coating lines, CR-1, CR-2, and C-3. These lines were limited to 5 tons per year VOC emissions based on a 12-month rolling average. The same permit established new annual VOC emission limits for the existing dyeing and finishing operations (23 tons per year combined) and the existing solvent coating lines #3 and #4 (56 tons per year). (Based on a letter from Duro to MA DEP, it appears that only two of the lines CR-1 and CR-2, were ever constructed).

In a permit entitled "VOC Emission Plan Final Approval", Application No. 4P93103 (dated April

10, 1995), it is specified that the tenter frames (#1-7), as well as Aqueous Coater #17/Dryer #1 and Parts Washers, are subject to VOC RACT requirements (310 CMR 7.18). This permit and these regulations require finishing formulations to be limited to 0.5 pounds (lb) of VOC per pound of solids as applied, and that the facility submit an emission control plan for MA DEP approval. This same permit also includes a requirement that the Wolverine thermal oxidizer have a minimum operating termperature of 1,400 degrees F. and a minimum VOC control efficiency of 93.1 %. It aslo indicates that "the thermal incinerator identified above controls VOC emissions from Solvent Coater No. 3 and Solvent Coater No. 4. All permitted operating parameters for the thermal incinerator must be maintained during any and all operations of Solvent Coater No. 3 and Solvent Coater No. 4." This permit also limits total annual VOC emissions from all textile processing activities from finishing, aqueous coating, and solvent coating to 79 tons per year. Daily records must be kept of coating formulations, emissions from each coating line, and operational characteristics of each coating line, as well as quantity of product produced.

The boilers at DF, and at the other Duro Finishing facilities, are subject to the MA opacity limits at 310 CMR 7.06(1) - no more than 40 % opacity at any time, and no than six minutes in any hour between 20 and 40% opacity.

DF Plant Walk-through: After discussion of process operations at DF, David Ethier led the EPA air and water inspectors on a tour of DF, beginning after lunch at 1:00 p.m. on the first day (February 24, 2004). They began in the third floor conference room with an overview of the dye house and boiler and other stacks. The EPA inspector requested and received permission to take photographs. He took photos of the various stacks, including the exhaust stacks of tenter frames 1 and 2, the smoke abators, and the thermal oxidizer. The inspectors then went outside to look at opacity from the boiler stacks. The sky background was white, leading to poor contrast and difficulty in taking an accurate Method 9 reading.

The inspectors then went back inside and toured the dye house and finishing areas. Three of the seven tenter frames were in use. Photographs were taken of one tenter frame producing camouflage fabric.

David Ethier showed the inspectors a new piece of blending equipment which was purchased in the 1996-1997 time period, but not used very much. The EPA inspector asked if this equipment would have increased production capacity; David Ethier said it would not but would provide for more quality assurance in the production process.

Next the inspectors observed the coating area. The EPA air inspector next observed the thermal oxidizer which treats solvent coating line VOC emissions. He observed the daily circular chart of temperature of this unit and photographed it. From 12:15 p.m. to 1:30 p.m., the temperature was 1,375 degrees F., below the required minimum operating temperature of 1,400 degrees F. The recorded temperature increased to 1,420 degrees F from 1:30 to 3:00 p.m. The current time was 3:20 p.m.; the chart appeared to lag actual time by 10-15 minutes. The chart started recording at

6:20 a.m. According to David Ethier, the chart was actually changed at 6:30 a.m. and the actual time on the chart recorded at 6:20 a.m. may actually be approximately 6:30 a.m. Thus there may be a lag in the readings for this reason.

At 3:41 p.m. the inspectors went to the boiler house. The EPA inspector observed the opacity LED readout which was reading 2.2%. The several boilers are tied in to a single opacity meter after a breeching that feeds the four individual boilers into a common stack that is fairly new and tall (No. 000). Boilers 2, 3, and 4 were running - 2 and 3 at full load, and 4 at low load.

The EPA air inspector requested to see and then reviewed the records of opacity, circular charts that each covered one week. A number of instances of high opacity appeared on the charts. About 14 months of charts were reviewed, from January 2003 to the date of the inspection. On the weekly charts beginning on the following dates, one or more likely opacity violations (more than 40% at any time, or between 20 and 40% for more than six minutes in an hour) were noted: 11/25/03, 11/11/03, 4/30/03, 8/12/03, 8/5/03, 7/1/03, 6/24/03, 5/27/03, 4/20/03, 5/5/03, 4/11/03, and 1/30/03. Other reports with possible violations were smudged or difficult to read due to apparent water damage.

The EPA air inspector also requested and reviewed daily records of temperature of the thermal incinerator. Time only permitted review of the circular temperature charts dating back to January 29, 2004. On the following dates, the charts indicated operation of the thermal oxidizer for some period below the required 1,400 degrees F. minimum temperature: 2/21/04, 2/23/04, 2/12/04, an undated chart, probably for 2/11/04 (filed between the charts for 2/10/04 and 2/12/04), 2/10/04, 1/31/04, 1/30/04, and 1/29/04. The time periods of operation at lower temperatures varied from 20 minutes to over 7 hours. The minimum temperature recorded was 1,310 degrees F. The EPA air inspector indicated that he would need to see a longer record of temperature records to determine how long the low readings had been occurring.

The next morning (Wed. 2/25/04) Steve Laderia, chief boiler supervisor for Duro, joined the group to discuss opacity issues. He stated that the opacity meters do not work right at startup due to vibration of the whole boiler which could throw the instrument out of alignment. He said that it is common for there to be white smoke emitted at startup, and when CO values are high. He doubted that the level of actual opacity during startup is as high as the meter is reading. There is an alarm that goes off at 15% opacity, and he said he is aggressive about following up. There are no soot blowers on any of the boilers at Duro.

Previously DF had several smaller stacks. MA DEP wanted a single stack and Duro engineers wanted a higher velocity. About five to seven years ago the present taller stack (192 feet high with a diameter of 32 inches at the top) was installed. The single opacity meter was placed downstream of the breeching. Steve Laderia said that the new arrangement led to a buildup of soot and smoke in the stack. He also said that rain can enter the stack; the resulting moisture carries out soot. The old boilers require a lot of tending and manual adjustment of combustion

parameters including oxygen and oil pressure. He actually uses the opacity levels as a guide to operating the boiler. If he notices the boiler smoking, he puts a CO2 analyzer in place and adjusts combustion accordingly. He said the boilers smoke infrequently - often at startup, or due to oil pressure difficulties. The EPA air inspector noted the repeated incidence of opacity over the MA DEP limits on the circular charts. Steve Laderia felt that this was due to a combination of problems with the meters and actual high opacity.

Plant 2 Process Description - Plant 2, formerly Pioneer Finishing, has operations that are very similar to those at DF (see Tables 1 and 2). It is used primarily as an overflow operation for Duro Finishing and houses the military products division of the overall corporation. Four boilers produce process heat and steam. There is a dyehouse and a finishing operation including three tenter frames (#1, #3, and #8; other numbers have apparently been dismantled. There is also a loop drier, a parts washer and a laminating line. A significant new operation at Plant 2 is the "Duroshield" process line, which produces fabric used in chemical weapons suits. David Ethier indicated that this line, E.U. 27-P2, was set up using a tenter frame (#4) that was moved from the second to the first floor and slightly modified to set up the new line. It replaced former tenter frame #5, which was dismantled. David Ethier said that this was a minor modification that did not require a permit, and that installation of the new line was a high priority for the company that was closely coordinated with MA DEP Duro considers the production process of this line to be a trade secret. David Ethier said that two tenter frames, #5 and #6, included in the Title V permit application were recently dismantled.

Permit & Other Regulatory Requirements - Plant 2: The tenter frames and parts washer are subject to VOC RACT requirements like those for DF.

Approval No. 4P93016 limits VOC emissions to 49.5 tons per year for all processes and fossil fuel utilization at Plant 2 based on a 12-month rolling average. Approval 4BP96043 establishes a "no visible emissions" opacity limit on the gas-fired "smoke abators" (thermal incinerators) that control tenter frame #1, the lop drier, and the Duroshield process. This approval also imposes the following limits on tenter frame #1: NOx, 0.06 tons per month and 0.71 tons per year; CO, 0.1 tpm and 1.12 tpy; PM, 0.04 tpm and 0.5 tpy; VOC, 0.02 tpm and 0.22 tpy; and SO2, 0.002 tpm and 0.02 tpy.

The wet ESP must meet a particulate limit of 0.771 lb/hr. Duro must maintain a log of operation, and provide notification of wet ESP failure to MA DEP, as per Approval No. 4P93016.

No separate permit was obtained for the Duroshield line. David Ethier indicated that this was not needed. However, he was not sure of how this piece of equipment was modified to permit the new line to operate. The EPA air inspector asked that the nature of the modifications to tenter frame #4 to establish this line be better explained later in the inspection.

Plant 2 - Discussion & Walkthrough: Steve Laderia noted that at Plant 2 he recently put in a new circulating chart opacity recorder for all four boilers (the smoke density meter was already there; just the chart recorder was changed, on 1/9/04). There are apparently problems at this plant with soot deposits forming on the eye of the opacity meter. There is an air purge system to clean the eye, but it does not work well due to insufficient air pressure. A better, cleaner source of compressed air is needed, at a cost of about $10,000.

The EPA inspectors and David Ethier then discussed current process operations and pollutant controls at Plant 2 (this information is summarized in Table 1). The EPA air inspector asked if annual boiler tuneup and regular maintenance required per NOx RACT requirements at 310 CMR 7.19(6) was being conducted - both of the boilers at Plant 2 (3-P2 and 4-P2) where this requirement applies, but also elsewhere at the Duro facilities where applicable (boilers 7-DF, 8-DF, 9-DF, and 5 Stedro/DTP). David Ethier said yes. The firm of Frank L. Rounds does annual boiler tuneups and Steve Laderia does monthly required maintenance. Records of normal maintenance are kept in boiler room logbooks. Binders with required sulfur level analysis in fuel are also kept in each boiler room. The boilers have not been stack tested. They believe they meet the boiler particulate limits (0.10 - 0.12 lb/mmBU in Approval SM-82-005-CO) based on the usually low opacity.

At 3:45 p.m. the plant walkthrough began. The EPA air inspector observed and photographed the wet ESP and tenter frames #3 and #8 which it treats. Both tenter frames are still operable. He next observed the dyeing department and the smoke abators for tenter frame T-1 and the Loop Dryer. The EPA air inspector went out again to check if there were any visible emissions from the wet ESP. The exhaust from the unit had a large amount of water vapor; the EPA air inspector did not see any uncombined smoke emissions at approximately 4:15 p.m.

Next the inspectors went to the basement. The EPA air inspector observed the main hazardous waste storage area. There were four lab packs, all labeled with the waste type and all with an accumulation start date of 2/13/04. Next the EPA air inspector saw and photographed a new piece of equipment, a laminator. It was tested two weeks previously, according to David Ethier; the test went well and the unit was being set up to run. (It is not known whether this piece of equipment has been permitted as of yet or if it emits VOCs; this issue was not further discussed at the inspection. No recent permit approval application or permit that appears to correspond to this piece of equipment was located in MA DEP files prior to the inspection.)

Next the EPA air inspector observed the Duroshield line. It was in operation. David Ethier was not sure of the details of how this line was modified. The EPA air inspector asked that he find out the exact nature of the changes and any documentation via correspondence that MA DEP was aware of the change.

Next the boiler house was visited. Will Silvani, the night engineer, said that opacity spikes of 10-15 seconds occur upon first startup of a boiler. When the burner opens, a solenoid valve opens

and there is a burst of fuel and atomizing air that pushes air and soot through the stack. The air inspector asked if there was any way to stop this. Mr. Silvani said "if there is a way, I don't know it. The opacity LED display was reading 4.78% at approximately 5:25 p.m. There was a Partlow MRC 5000 circular recording chart in place. There were four boilers - two small Cleaver Brooks boilers and two big Johnston boilers (#1 and #2). There was a boiler maintenance log that appeared to be regularly kept, and calibration tapes of CO and CO2 levels.

Next the EPA air inspector observed the Duroshield process stack emissions. There was a faint trace of heat but no visible emissions. The EPA air inspector saw and photographed this stack at 5:31 p.m. This concluded the day's inspection.

DTP/Stedro Process Description: At DTP (also known as the "Print Plant") the production staff print on the fabric if this process is needed. This is the only Duro facility where fabric is printed. Printing is accomplished by applying print pastes, chemicals and pigments to the fabric. The pattern is laid down using a flexible metallic screen, somewhat like silkscreening. After printing, the fabric passes through a natural gas fired dryer. Solvent fumes are controlled by an incinerator. There are four printers, termed Stork 101 to 104 (see Tables 1 and 2). DTP also finishes fabric using three tenter frames similar to those used at DF. Wet ESP #1 treats three of the printers; wet ESP #2 treats three tenter frames and printer Stork #104.

Some fabric is then passed through an ager to enhance fabric color and set the color by exposure to steam (formerly an acid ager was used, but its use has been discontinued according to David Ethier). No VOC-containing materials are used in the ager, only steam.

DTP operates three boilers; each has the capacity to burn either No. 6 fuel oil and/or natural gas, but at present they burn only natural gas (the oil tanks have been removed). Because the gas is more expensive, production at DTP relies on the boilers at Stedro (four of which can burn fuel oil and gas, and one only which burns gas) for process heat and steam. The primary operations at Stedro at present are these five boilers. Duro management has in process a sale of the Stedro facility to the City of Fall River. In spring 2003, according to David Ethier, chemical mixing operations at Stedro ceased. The company plans to eventually bring the chemical mixing vats still located at Stedro to DTP for use in wastewater treatment.

Permit & Other Regulatory Requirements - DTP/Stedro: All of the printers are subject to VOC RACT requirements. All of the printers except Stork 103 also have permit requirements. Stork 103 was determined by MA DEP to have been replaced in 1993 without a permit having been obtained. In response to an NON dated October 23, 1996, DTP submitted an application for a non-major CPA in June 2001. This printer will be subject to BACT requirements that MA DEP is working to define. Seth Pickering of MA DEP is working on this permit approval.

Approval 4P88231 controls stork printers 101, 102, and 103 and wet ESP No.1; it imposes a PM limit of 0.756 lb/hr and a requirement for no visible emissions (zero % opacity). Printer Stork

104, tenter frames T-1 and T-2 and Wet ESP #2 are permitted by Approval No. 4P92088 to not exceed 0.21 lb/hr of particulate and no visible emissions (zero % opacity). The printing operations are limited to total VOC emissions of 312 lb/day and 39 tpy by Approval 4P92088.

Stedro boilers No. 1-4 have received Restricted Emission Status and they are subject to varying NOx, VOC, PM, and SO2 limits per Approval 4R94183. All must meet a sulfur in fuel limit of 55 lb/1,000 gal oil. Boiler No. 5 was formerly at Plant 2. It was moved to Stedro and installed in 2002. This boiler received a 7.02 Plan Approval (Approval No. 4P98006). It burns only natural gas and has a heat input of 25.1 mm BTU/hr. This permit limits PM to 0.01 lb/mmBTU and 1.1 tpy; NOx to 0.12 lb/mmBTU and 13.19 tpy; CO to 0.15 lb/mmBTU and 16.49 tpy; VOC to 0.016 lb/mmBTU and 1.76 tpy; SO2 to 0.001 lb/mmBTU, and opacity to no visible emissions. It is subject to NOx RACT requirements to annually tune the boilers and retain records of the annual tuneups and regular maintenance. It is required to have a continuously-recording opacity meter and keep records per MA DEP opacity regulations at 310 CMR 7.04(2).

Duro Textile Printers and Stedro - Discussion & Walkthrough: The EPA inspectors arrived at 8:57 a.m. on Thursday February 26. The EPA air inspector observed and photographed the wet ESP controlling tenter frames T-1 to T-3 and Stork 103 printer. There was substantial water vapor and no evident uncombined smoke in the emissions. The second wet ESP was not on.

Next the EPA inspectors initiated discussion of Duro Textile Printers and Stedro. David Ethier said that the numbers assigned by Duro to the tenter frames had been frequently changed. He thought that the DEP NON dated 10/23/96 might have been due to confusion on this renumbering. The EPA air inspector brought out the NON and clarified that the violation was for a printer that was replaced in 1993 with a used printer, not a tenter frame. David Ethier agreed.

The four DTP boilers are rarely used. Stedro boilers 1-4 burn #6 fuel oil and are subject to Massachusetts opacity limits. Stedro boiler 5, moved from Plant 2, burns natural gas, has a 0% opacity limit and an opacity meter (it is rarely used due to the cost of gas). Stedro boilers 1-4 previously had opacity meters. However, since these boilers are less than 40 mmBTU/hr capacity, they no longer require opacity meters under the Massachusetts regulations just cited. David Ethier said that he had instructed the boilerhouse staff to remove the opacity meters, not wanting to document violations.

The EPA air inspector asked whether the printing operation should be subject to any MACT standard - either the Printing and Publishing MACT standard (Subpart KK) or the Printing, Coating, and Dyeing of Fabrics and Other Textiles MACT standard (Subpart OOOO). Subpart KK exempts printing on fabric; David Ethier said Duro does not do any printing on paper substrates. Hence, it does not appear that Subpart KK applies to Duro.

David Ethier said that the company had concluded that Subpart OOOO would apply to the printing operations at DTP and solvent coating at DF. The notification and compliance dates have

not yet arrived (notification is due in August 2004) but the company is beginning to plan for compliance. It intends to work with its suppliers to reduce VOCs in the printing formulations. The thermal oxidizer which treats the solvent-based coating line at DF will also be covered and will have to improve from its current 93% VOC destruction efficiency to 98% to meet MACT requirements.

The plant walkthrough began at 1:00 p.m. at Stedro (on the second level, which is used as a warehouse area). Next the EPA inspectors went to the lower level and observed a steam ager treating camouflage fabric. There were two chemical mixing tanks, not in use. The EPA inspectors next saw the pH sampler and adjacent pit. Water was flowing and there was a sewage smell.

Next the EPA inspectors went to the Stedro boiler room. The four older fuel oil boilers were in one room and the newer natural gas boiler in an adjacent room. Steve Laderia said that he had been in the process of adding new opacity meters on the four older boilers when he was told to stop since they were not necessary to meet MA DEP regulations. One new opacity meter had already been installed; he stopped adding new ones.

The EPA air inspector inspected the boiler maintenance logs. There was a note on February 26, 2004 from Steve Laderia in the log that the #5 boiler feed water valve was not operating and closing properly. The note said that the boiler needed to be run by hand and that "if you run #5 boiler, make sure you watch it if water enters the steam header. Boiler may burst". The EPA air inspector asked if this note suggested a serious problem with the boiler. The facility staff said that this note probably did not suggest a serious problem because the boiler could be run on manual and would be scheduled for maintenance. Steve Laderia said the plan was to fix the boiler on Saturday and the repair would be logged in then.

Next the EPA air inspector observed the boiler stacks outside the building. All had very low or no visible emissions.

Next the EPA air inspector saw the DTP boiler house. There are three boilers. The oil tanks have been removed and the boilers run on all gas. Boiler #2 runs for space heating.

Next the EPA air inspector saw the DTP production area. He observed tenter frame 3 in operation producing digital camouflage fabric. There are a total of three tenter frame/drier units. There was a new steam ager operating for the first time. David Ethier said that the unit does not produce VOCs (only steam). It does allow more flexibility and a potentially higher production rate. The other steam ager was running 24/7.

The EPA air inspector asked about whether DTP tracks compliance with its daily VOC emission limits. David Ethier said that the company's Customer Service Dept. supplies him with daily chemical usage data, from which he can estimate daily VOC emissions. He receives the data on a

quarterly (not daily) basis, but he can obtain daily chemical usage data for a particular day if he asks for it.

The EPA air inspector next observed and photographed the Wet ESP #2 that treats three tenter frames and printer #104. Next he observed the fabric preparation area. VOCs are used for washing the fabric (acetic acid). This emission unit is part of the non-major CPA application that MA DEP is still considering.

Next the EPA air inspector observed and photographed printer #4, the new unit added in 1993. Ink is distributed to the fabric from inside a hollow cylinder. The image is printed by use of a rotary screen that contains the image; the open (non-image) area does not block the ink and is printed. The EPA air inspector examined and photographed one of the rotary screens. Duro's revised Title V application had referred to the printing process as "flexographic", so the EPA air inspector wanted to examine if the printing process was flexography as defined and regulated by the Printing and Publishing MACT Standard (40 CFR 63 Subpart KK). The image is not raised off the surface, so the process is not flexography as defined in Subpart KK. The EPA air inspector saw and confirmed the presence of the other three printing lines; there are a total of four, consistent with the Title V permit application.

The EPA air and water inspection then left DTP.

Bayside Laminating - Process Description, Walkthrough and Discussion: At 3:30 p.m. EPA air and water inspectors met David Ethier in the parking lot of Bayside Laminating at 848 Airport Road in the northern part of Fall River to conduct a walkthrough. He is responsible for compliance at this facility also. The area is a modern industrial park. The company rents space in the building from New England Rope.

The EPA air inspector photographed the building exterior while the EPA water inspector asked a series of questions pertaining to stormwater management. They then entered the building accompanied by David Ethier. Upon entry there was a distinct solvent odor. David Ethier said it was methylacrylate (spelling uncertain, possibly methyl methacrylate). The building was a large warehouse-like undivided space.

The EPA air inspector then saw the production line where a reflective coating was being applied. Bruce Lopes, Plant Manager, arrived and joined the discussion. According to Bruce Lopes, this facility has two basic types of operation: 1) wet coating and 2) dry adhesive coating or "laminating". There are two wet lines and three dry lines, each with a distinctly-named piece of equipment. The two wet lines use pieces of machinery termed the "large Artos" and the "small Artos" (Artos is the name of the manufacturer). These pieces of equipment can be used for wet coating but not laminating. The wet coating line was the one first one observed by the EPA inspector, where the reflective coating was being applied. In wet coating, which resembles wet coating as done at DF, a liquid coating is applied via a spray bath, followed by drying in an oven.

Frequently this involves a reflective coating (for example, on fabric for uniforms for UPS so deliverymen can be seen at night in headlights).

The wet coating total production line seems to be integrated with operations at one or another of the other Duro facilities. Bruce Lopes said that the reflective coating being applied on the date of the inspection on the wet coating line was actually made at DTP. It was then brought to Bayside where the actual reflective material or "satellite dishes" (a glass powder that includes small reflective beads) was mixed into the coating. Application of this wet coating at Bayside may then be followed by the material going back to DF - for example, for application of a water-repellant coating.

Bruce Lopes said that Bayside has three lines that apply a dry adhesive to a fabric: the Saladin, Caratach,, and Rototherm units. A light powder coat of dry adhesive is sprayed on the fabric and adhered via application of electric heat. The Saladin machine does only this adhesive application process. The Caratach and Rototherm units also apply dry powder adhesive to fabric, but then add an additional "lamination" step. As described Bruce Lopes, "lamination" is like gluing two pieces of fabric together - not like what is commonly called laminating in which a topcoat is added to a substrate using heat. In the laminating presently done by Bayside, the two pieces of fabric are batted together and bonded with heat and pressure applied by two hot rollers. According to Bruce Lopes, the Caratach unit was installed in 1996 or 1997 and the Rototherm line four years ago, in 1999.

Permit & Other Regulatory Requirements - Bayside Laminating: The status and applicability of permits at Bayside Laminating is confusing and hard to interpret because of incomplete files, changes in the location of the facility, its processes, changing terminology and personnel. David Ethier, while presently responsible for compliance at this facility, did not know the permitting history very well. This has in the past been handled by Nick Santori, who has retired but still does some consulting work for the company dealing with compliance and permit issues. He was away in Florida at the time of the inspection but due to return in several weeks.

In November 1994, Bayside Laminating (with Earthtech as its consultant) submitted an application for a non-major CPA to cover its existing fabric printing operations at 114 Globe Mills Avenue in Fall River. The application stated that Bayside had recently learned that its formulations contained VOCs. The application focused on line P-1, a fabric printing line. As a result of this application, an approval (CPA # 4P94195) was apparently issued to Bayside Laminating at 114 Globe Mills Ave. in Fall River on March 28, 1995 (a draft but not a final copy of this permit, dated March 1, 1995, was located during MA DEP file review). Based on the draft permit, this may have covered:

- a "steam laminator" (it is not clear at this time which line this was, but it may be one of the Artos units, a wet coating line; "laminator" may be used in a different sense than used by Bruce Lopes during the inspection);

- Coater No. 2 (identified in the CPA as the "Saladin Sinter" unit, which had an electric drying oven; this line apparently includes equipment presently used on one of the dry adhesive lines), and

- Coater No. 3. Coater No. 3 is also referred to as line P-1 in the permit. At this time Coater No.3/line P1 also included a Stork fabric printer like those in use at DTP. Coater No.3/line P1 was manufactured by Stalk and had an Artos drying oven heated by natural gas. Based on this identification, Coater Coater No.3/line P1 appears to include equipment on one of the wet coating lines identified by Bruce Lopes at the inspection. Coater No.3/line P1 apparently was also the line that had the highest VOC emissions. This approval limited VOC emissions from the facility to 23.87 tons per year. The steam laminator and Coater No.2 (the Saladin unit) would have been limited to 0 VOC emissions per year.

The move of Bayside Operations to 848 Airport Road in Fall River was apparently permitted by MA DEP in a Conditional Approval (no. 4P95120) that was issued on October 13, 1995, located prior to the inspection in MA DEP files. This permit covered two existing lines termed Units P1 and P2, and two natural gas boilers. This permit appears to cover the two wet coating lines or the "large Artos" (probably P1) and "small Artos" (probably P2) lines as presently referred to by Bruce Lopes. This approval limited the VOC content of coatings on the two lines to 0.5 lb VOC per pound of solids as applied. The lines are referred to as "printer/laminator/dryer" lines and are limited to 29.9 tons of VOC per year of "potential emissions".

A Conditional Approval (no. 4P98019) was issued on February 12, 1999 for use of two new coating formulations, limiting them to 0.9 lb VOC/lb solids. This permit also limited total monthly and annual VOC and HAP emissions from the two existing lines. VOC emissions were limited to 29.9 tons per year. HAPs were limited to 9.9 tons per year for any individual HAP and 24.9 tons per year for the aggregate, making the facility a "synthetic minor"). Coating usage was also limited 29,333 gallons per month and 234,509 gallons per year. It superseded Approval no. 4P95120 for all requirements except the 0.5 lb VOC per pound of solids as applied for the two existing coating formulations. It required monthly recordkeeping for VOC and HAP emissions.

According to Bruce Lopes, the Rototherm dry adhesive/laminating line was added approximately four years ago, in 1999. He stated that no MA DEP permit was received for this new operation because it did not give off many VOCs. Nick Santori of Duro handled this issue. Bruce Lopes stated that there is approximately one ppm of VOC in the adhesive. There is no mention of this line in any of the other approvals cited above that were located in MA DEP files. The EPA air inspector asked that any such permit for the Rototherm line be located. (Subsequent to the inspection, further review of the permits in hand give no indication that the Caratach dry adhesive/laminating line had been permitted prior to operation.) It is not known if either the Rototherm or Caratach units were below the permit emission thresholds. The EPA air inspector photographed the wet line in operation, the dry adhesive units (the Rototherm line was in use),

and the coating mixture area.

VII Monitoring Reports & Records Received/Reviewed

Process	Report Type	Received by/ Reviewed	Req'd by Which Regulation?	Report Period or Deadline mm/dd/yy -	Comments
Boilers 3-P2, 4-P2, 7-DF, 8-DF, 9-DF, 5 Stedro-DTP	*Records of normal maintenance and annual tuneups*	*State/EPA*	*NOx RACT - 310 CMR 7.19(6)*	*Ongoing maintenance, annual tuneups*	*Maintenance records regularly maintained in logbooks*
Boilers >40 MM BTU/hr - DF, Plant 2, DTP, Stedro	*Opacity records of smoke density meters*	*EPA/EPA*	*310 CMR 7.04(2)*	*1/03-2/04*	*Circular chart records generally available; frequent opacity exceedances*
DF - Solvent coating & finishing	*Thermal daily oxidizer temperature charts, daily coating line VOC emissions*	*State/EPA*	*Plan Approval 4P93103*	*01/290/04-2/24/04*	*Some dates with Temps. below 1,4000 deg. F. minimum recorded*

DF - Solvent coating & finishing	*Coating & finishing chemical formulation/ VOC content*	*State/EPA*	*VOC RACT*	*8/19/03-2/27/04*	*Potential problems with meeting VOC lb/hr emission rate if at full production rate noted on two dates*
DF - Dyehouse & Finishing, Aqueous & Solvent coating	*12-month rolling average VOC emissions*	*State/EPA*	*Approval # 4P3103*	*9/01-1/04 Ongoing - monthly calculation of 12-month rolling averages*	*Within emission limits*
DTP - Total Facility	*12-month rolling average of VOC emissions*	*State/EPA*	*Approvals SM--85-168-IF (39 tpy printing), 4992088,4P9 4097 (5 tons frame #4, 0.09 tpy boilers)*	*1/02-1/04*	*Within emission limits of 47.88 tpy*

On Friday, February 27, 2004 at 9:00 a.m., the EPA air and water inspectors returned to David Ethier's office at Duro Finishing to do air records review for all five of the facilities. The first topic discussed was the tracking of VOC emissions from the various pieces of production equipment. The EPA air inspector expressed concern about whether daily VOC emission limits were being tracked. David Ethier said that "we can get that information". They do not establish daily VOC emission totals; they do track 12-month rolling averages. He said that daily VOC emissions could be estimated from daily production levels. He said that the data available varied by facility and he would contact appropriate people at the various facilities to obtain the available data that morning. He then contacted Mark Hinch who joined the discussion while searching the computer records for available information.

Mark Hinch said that he has production level data readily available since 1999 for DF. Prior to November 2002, total production at DF was approximately 600,000 to 800,000 yards per month. Now it is approximately 200,000 yards per month (he stated that these were rough estimates he

wanted to confirm). He worked to obtain the production records, but they were not available as of the close of the inspection. David Ethier did produce daily chemical use data for DF for the period 8/03 to 2/27/04.

The EPA air inspector reviewed records listed in the table above. He also asked whether the facility was keeping the required daily records of VOC emissions from DTP (per Approval 4P92088, VOC emissions from printing operations at DTP are limited to 312 lbs/day and 39 tpy). David Ethier said that the facility does not have daily VOC emission estimates. They do track and have records for monthly VOC emissions. He supplied a record from January 2002 through January 2004 of monthly VOC emissions for the whole facility. The EPA air inspector reviewed this record. The highest monthly VOC emissions were 5,396.96 pounds of VOC per month in February 2002. On this basis and assuming 20 days of operation per month, the EPA air inspector roughly estimated that daily VOC emissions in that month could have been approximately 270 pounds per day (approximately 5,400 pounds divided by 20 working days). 270 lb/day is approximately 86% of the 312 lb/day VOC emission limit. On that basis, it seems possible that on certain days the 312 lb/day VOC limit could be exceeded. David Ethier said that he does track lb/day VOC emissions during the ozone season.

VIII Information on previous enforcement actions:

As previously indicated, printer Stork 103 at DTP was determined by MA DEP to have been replaced in 1993 without a permit having been obtained. In response to an NON dated October 23, 1996, DTP submitted an application for a non-major CPA in June 2001.

At DF, MA DEP issued an NON as part of an Administrative Consent Order (ACOP-SE-96-7002) signed by MA DEP and in effect on August 13, 1996. This NON covered opacity violations at the #3 tenter range and failure to conduct facilitywide daily recordkeeping of VOC emissions. In response to the Consent Decree Duro installed "smoke abators" (thermal oxidizers) to control opacity from the tenter frames.

IX Compliance Assistance Activities:

The EPA air inspector provided general information on air quality regulatory requirements applicable to the facility. He indicated that EPA Region I conducted a variety of compliance assistance activities and had information available.

X Findings and recommendations:

The closing conference was held on the late afternoon of Friday February 27, 2004, with Mansour Nejad joining David Ethier of Duro. The EPA air inspector highlighted the following compliance problems that were identified during the inspection:

- Frequent opacity exceedances at the oil-fired boilers. Brief spikes of opacity over 40% occur nearly every day, and there are also more prolonged periods of high opacity over the 20 and 40% limits in about 14 months of circular charts reviewed.

- The operation of the thermal oxidizer at DF treating the solvent coating line operating below the required minimum temperature of 1,400 degrees F. Earlier that morning, the EPA air inspector raised this topic with David Ethier and noted that there was supposed to be an interlock that prevented the coating line from operating when the oxidizer is below 1,400 degrees F. David Ethier said that there is apparently no interlock on the thermal oxidizer that prevents the line from operating when the temperature of the thermal incinerator is below 1,400 degrees F. He acknowledged that the unit has operated at less than 1,400 degrees F. At the closing conference, Mansour Nejad said that the low temperature would be promptly addressed.

- The need for daily recordkeeping of VOC emissions. The EPA air inspector cited the instance of missing daily records at the total DTP facility per Approval 4P92088 as one specific example. However, daily recordkeeping is required for several production lines and pieces of equipment at the facilities inspected; lack of daily VOC estimates is a pervasive problem at the facility. The company has proposed eliminating daily recordkeeping in its revised Title V permit application for the four nearby operations, but the requirements are still in effect.

- The Rototherm laminating line at Bayside Laminating had no evidence of a permit having been issued before construction and operation. The EPA air inspector asked for any permits issued or other relevant information or correspondence in company files. (Facility staff said that Nick Santori, currently working part-time, knew the history of permitting at this facility and could address this when he returned from Florida).

- The question of whether the new Duroshield line at Plant 2 should have received a permit before construction and operation. Mansour Nejad discussed the modifications made to this existing unit.

- The proper operation of the smoke density meters and the number of meters in place (including Duro's removal of some smoke density meters at Stedro because they were below the 40 mm BTU/hr threshold that requires a meter, which has made properly controlling combustion more difficult). Mansour Nejad said that these opacity meters would be put back in place.

The EPA air inspector also indicated that the facility might benefit from preparing an Environmental Management System (EMS) in the light of its complex regulatory requirements. Mansour Nejad indicated that the company was committed to environmental protection and would promptly address the identified compliance problems.

XI Followup Issues

The permit status and requirements will need to be determined for the several pieces of equipment for which permits could not be identified (including the new laminator at Plant 2, in addition to those discussed above as noted at the closing conference). A longer period of record for the opacity circular charts and the temperature charts for the thermal oxidizer at DF) also needs to be provided. In addition, the status of daily recordkeeping of production levels and air emissions of VOCs and other air pollutants for all units requiring it needs to be determined. An information request letter requesting this information under the authority of Section 114 of the Clean Air Act is needed.

XII Multimedia Checklist

A checklist was completed at this inspection because a water inspection earlier in the year did not include the multimedia checklist.

Attachments
1. Facility maps
2. Photographs
3. Supporting Information and Tables

Photo 1 - Duro Finishing - overlooking Dye House and boiler stack